SCIENTIFIC CORN BREEDING

THE PIONEER WAY

POLLEN GUN

THE MOST EXTENSIVE CORN BREEDING PROGRAM IN THE CORN BELT

DES MOINES

PIONEER HI-BRED CORN COMPANY

PIONEER CORN BREEDERS—FIRST COMMERCIAL PRODUCERS

THEIR LABORATORY and workshop the rich soil of the Corn Belt. Pioneer corn breeders scientifically develop and produce hybrid seed corn which, year after year, leads the field in superior quality and outstanding performance.

Their tireless efforts and experimental research set the pace for hybrid corn development and make invaluable contributions toward better farming and higher agricultural standards in the corn country.

Special corn investigations are made for PIONEER by Mr. Goodsell who has worked four years for the company. He holds a B.S. degree from Iowa State College and an M.S. degree from Texas A. & M.

Mr. Baker, corn breeding specialist and graduate of Iowa State College, has been with the Pioneer Hi-Bred Corn Company for ten years.

Corn Yield testing over the entire Corn Belt is Mr. Weatherspoon's chief duty. He has had seven years of service with PIONEER, and holds a B.S. degree from Oregon State College and an M.S. degree from Iowa State College.

Parent corn production is handled by Mr. Temple who has worked for five years with PIONEER hybrid seed corn.

Pioneer's eastern corn belt plots are conducted by Mr. Brawner who holds B.S. and M.S. degrees from Nebraska U.

Early Maturing inbreds are developed by Mr. Collins who has worked ten years with the Pioneer Hi-Bred Corn Co.

PIONEER CORN BREEDING PROGRAM

PIONEER CORN BREEDERS employ every scientific method known in plant breeding to produce hybrid seed corn of outstanding quality. Behind PIONEER hybrid superiority there stands long years of experience . . . sound, careful breeding practices . . . and skilled, capable corn breeders.

With headquarters located in Iowa, PIONEER'S extensive hybrid corn breeding program reaches throughout the Corn Belt. The largest and most important PIONEER breeding station is situated nine miles northwest of Des Moines near Johnston, Iowa, where Iowa's first breeding work on hybrid corn was started over a quarter-century ago by founders of the Pioneer Hi-Bred Corn Company. It is at Johnston that much of the primary work on inbreds and experimental crosses for the North-central, South-central and Southern Corn Belt is conducted.

PIONEER maintains a separate corn breeding unit at Algona, Iowa, for the development and production of Northern Corn Belt hybrids. This branch is one of the largest corn breeding stations in the Corn Belt devoted solely to the breeding of early maturing hybrid corn.

The thousands of farmers who plant PIONEER every year receive the profitable benefits of superior corn breeding . . . they take pride in corn that outyields their neighbor's field . . . corn that stands up better and looks better . . . and corn that puts money in the bank.

CORN BREEDERS' HEADQUARTERS IN BREEDING PLOT

INBREEDING—THE FIRST STEP

THE first requisite of a hybrid corn program is the development of pure inbred lines which possess desirable traits.

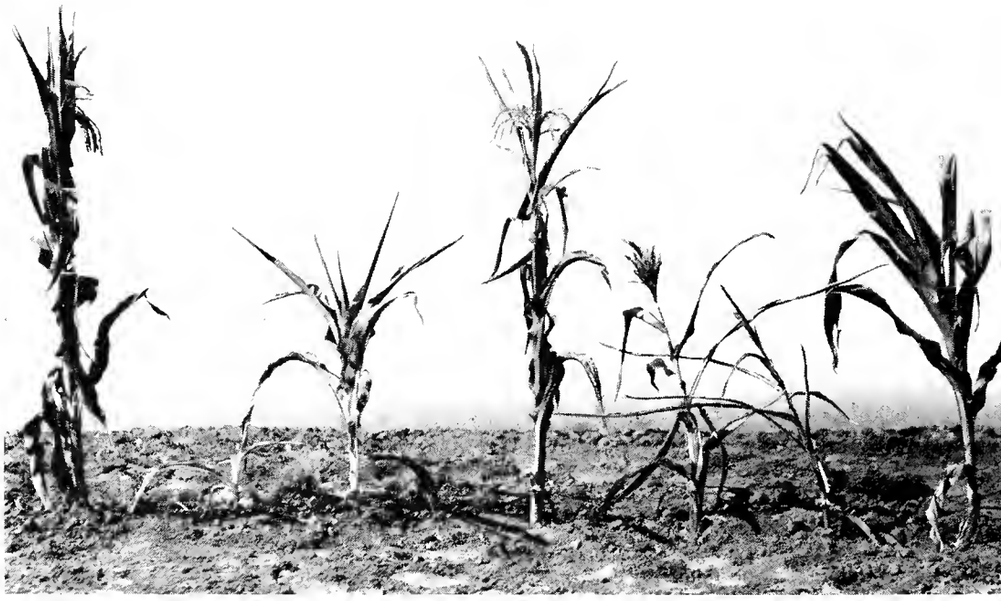
Inbreeding selected corn ears uncovers varied plant types. Some offsprings turn out strong and vigorous and others weak and useless. PIONEER breeders, each year, discard thousands of weak plants, saving only desirable types for further development.

After many years of careful inbreeding, weak and undesirable characteristics become weeded out. Only the strongest plant varieties survive the rigorous inbreeding period which usually lasts from five to eight years.

The result is a pure inbred, small and frail in appearance, but uniform and true to definite characteristics, such as disease resistance, plant height, stiffness of stalk, heaviness of root system, size of ear, ear height, and color of leaf.

An inbred strain remains pure, and breeds true to its characteristics as long as foreign pollen does not contaminate it.

INBREEDING A STALK OF CORN

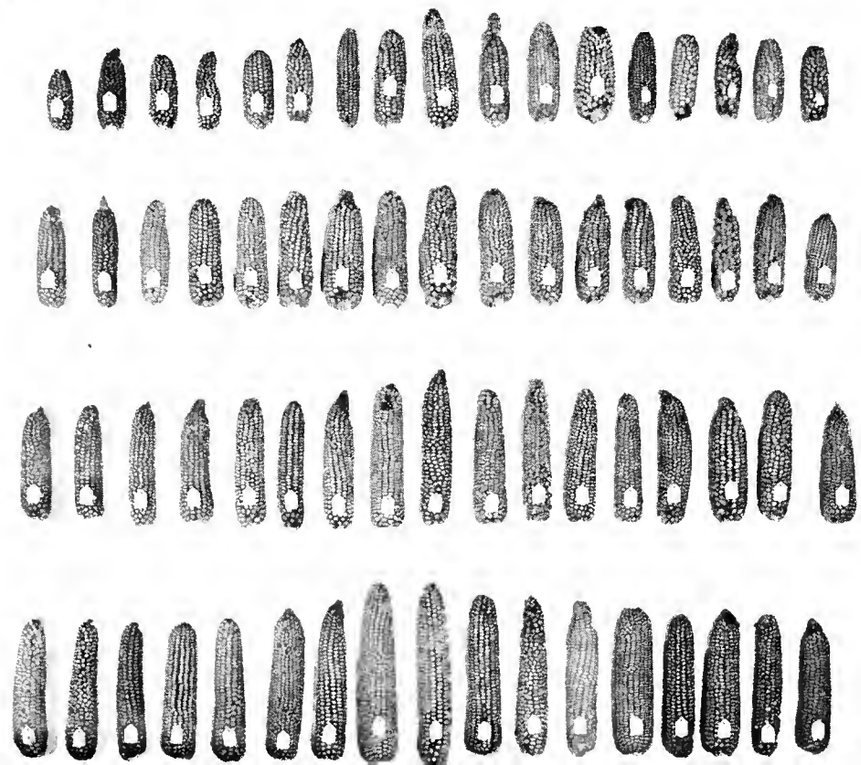


Inbreeding separates weak and strong plants. These plants are descendants of the same original ear of open-pollinated corn. Only healthy offspring are saved.

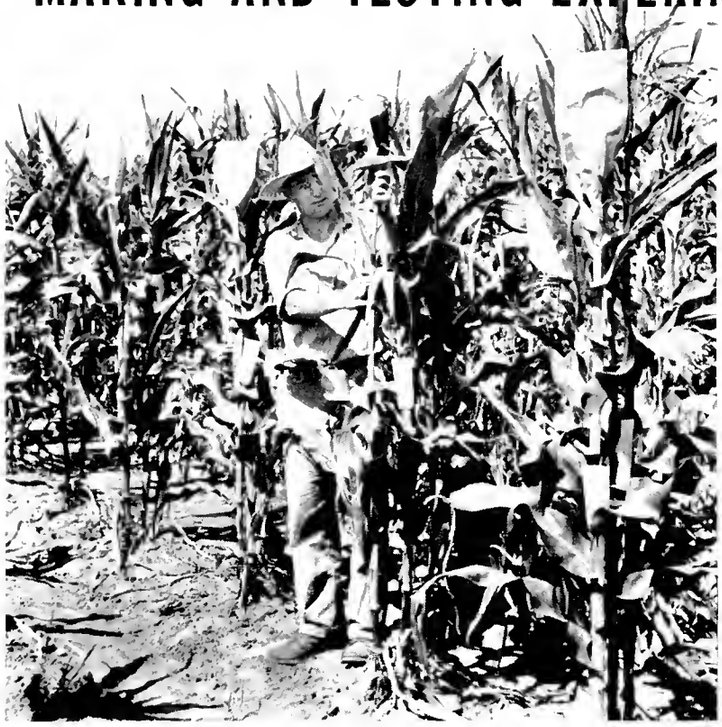
The Pioneer Hi-Bred Corn Company, first commercial producer of hybrid seed corn, has the largest and most valuable collection of inbred strains in the Corn Belt.

A Pioneer Inbred Strain showing uniformity of plant size and ear height after six years of rigorous inbreeding.

A FEW PIONEER INBREDS



MAKING AND TESTING EXPERIMENTAL HYBRID CROSSES—THE SECOND STEP



POLLEN BAGS ON TASSELS; GLASSINE BAGS OVER EARSHOOTS

CROSSING TWO INBREDS TO PRODUCE A "SINGLE CROSS"

BREEDERS CROSSING TWO "SINGLE CROSS" HYBRIDS

PIONEER BREEDERS make about 350,000 hand-pollinations every year. When corn breeders cross two pure inbreds, each bearing different characteristics, the off-spring, a "two-way" or "single cross" inherits the best characteristics of its parents, and always grows stronger and more vigorous than either of them.

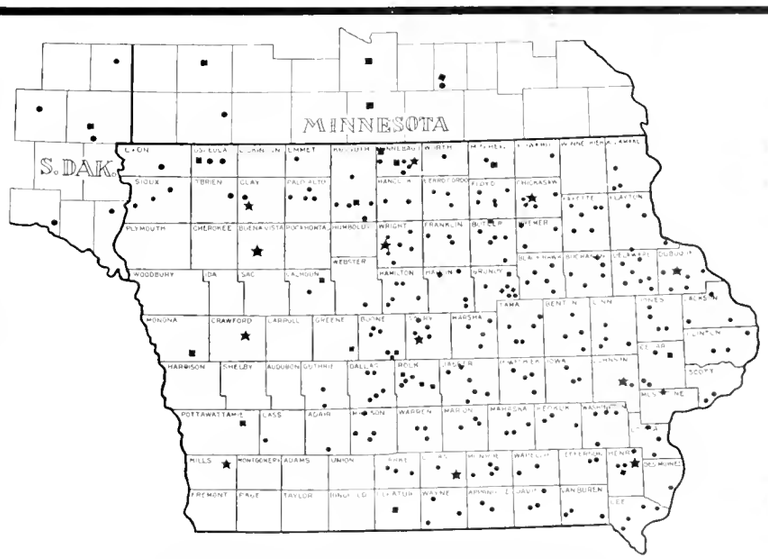
Out of thousands of "single crosses" produced every year, only a few are good enough to use for experimental work on final "four-way crosses."

The "four-way" hybrid cross is developed by crossing a pair of "two-way" or "single crosses," each of which possesses unlike characteristics.

Of the hundreds of final crosses made year after year by PIONEER corn breeders, only a small number prove superior to the present commercial hybrids.

These few outstanding combinations are then tested, over a number of years, for yield, lodging, and maturity, in localities where they are to be sold.

THE TWO INBREDS ON EITHER SIDE WERE CROSSED TO PRODUCE HYBRID IN THE CENTER



Locations showing large yield test plots where PIONEER hybrid crosses were tested in Iowa, Minnesota, and South Dakota, last year.

INCREASING THE SUPPLY OF PARENT CORN—THE THIRD STEP

AFTER NEW PIONEER HYBRIDS demonstrate and prove their superiority throughout the testing period which lasts from three to five years, they are ready for commerical production.

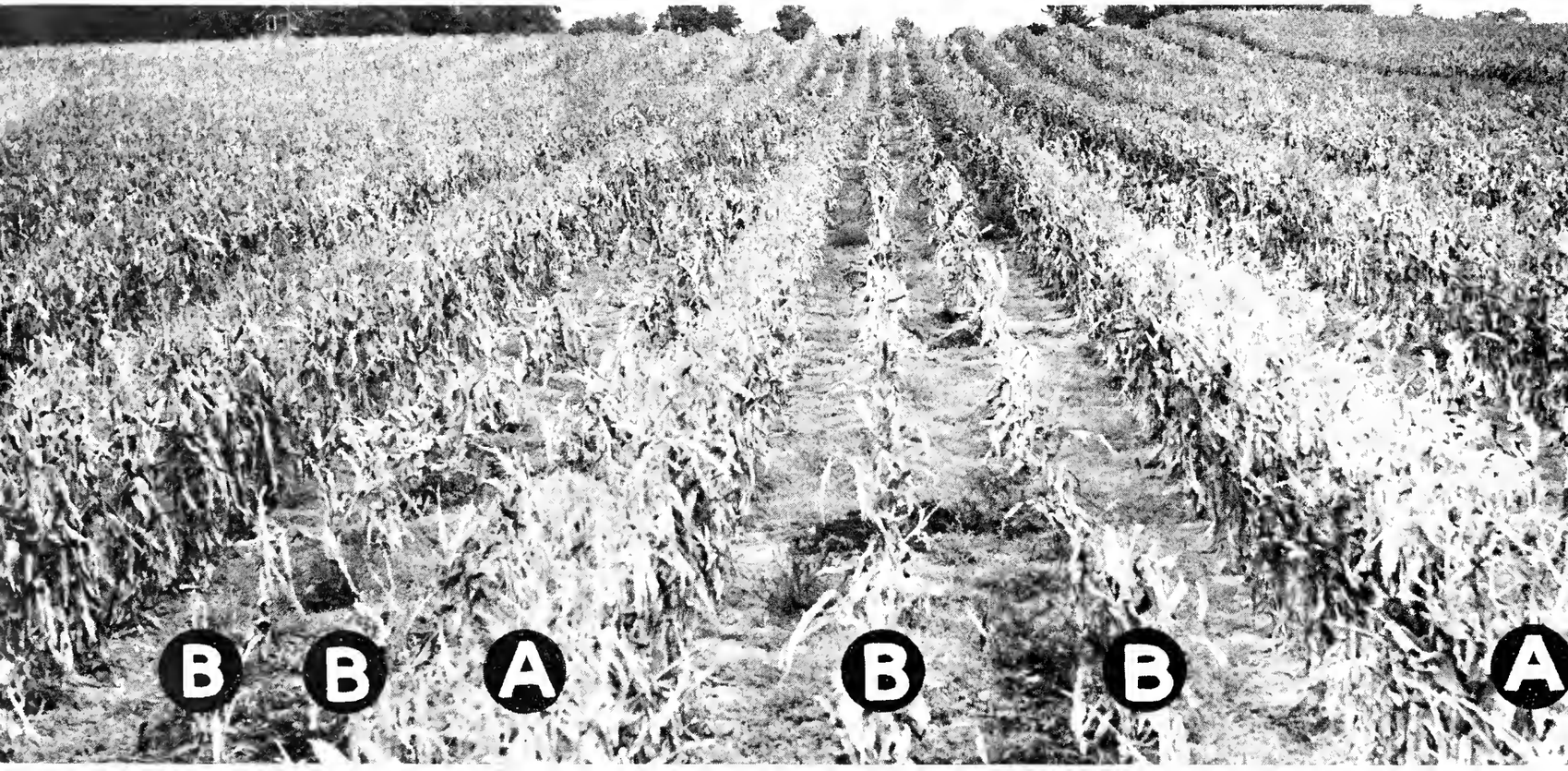
But before a new hybrid can be produced on a large scale, an increase must be made on the supply of seed for the inbreds which make up its parentage.

To protect the plots from foreign pollen, each of the four original inbred strains is planted in isolated fields located 10 or more rods from the nearest cornfield.

The seed harvested from the four fields is used to plant the four inbreds we will call A, B, C and D. These are then cross-bred in pairs to produce two "single crosses."

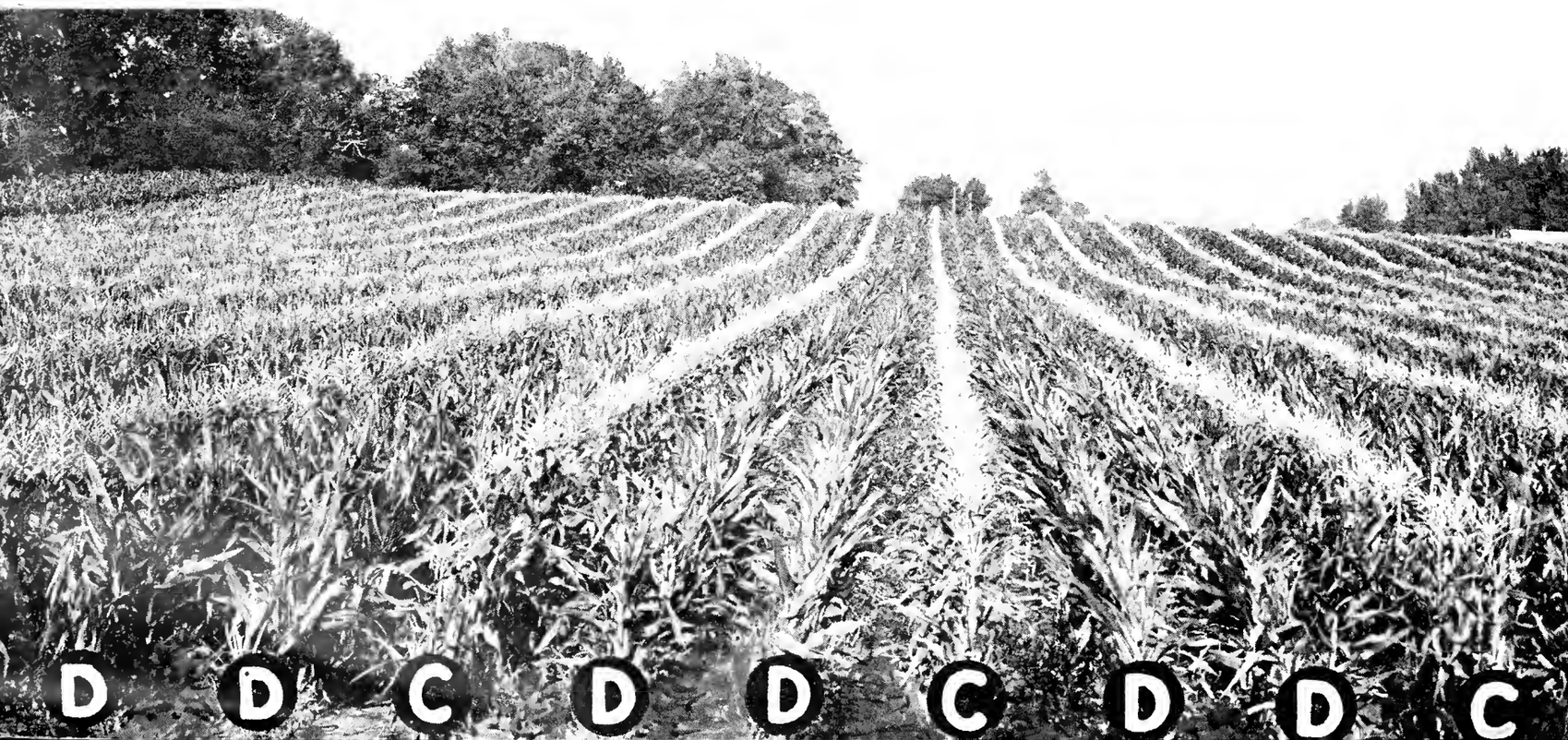
To produce a "single cross," PIONEER corn breeders alternate one row of Inbred A (male) with two rows of Inbred B (female) all through a field. The female is detasseled to prevent self-pollination. The pollen from the tassels of male Inbred A cross-pollinates the silks of female Inbred B.

Inbreds C (male) and D (female) are hybridized in the same manner. Seed picked from female rows B and D grows two different "single crosses" which are then crossed to make the final "four-way" hybrid cross.

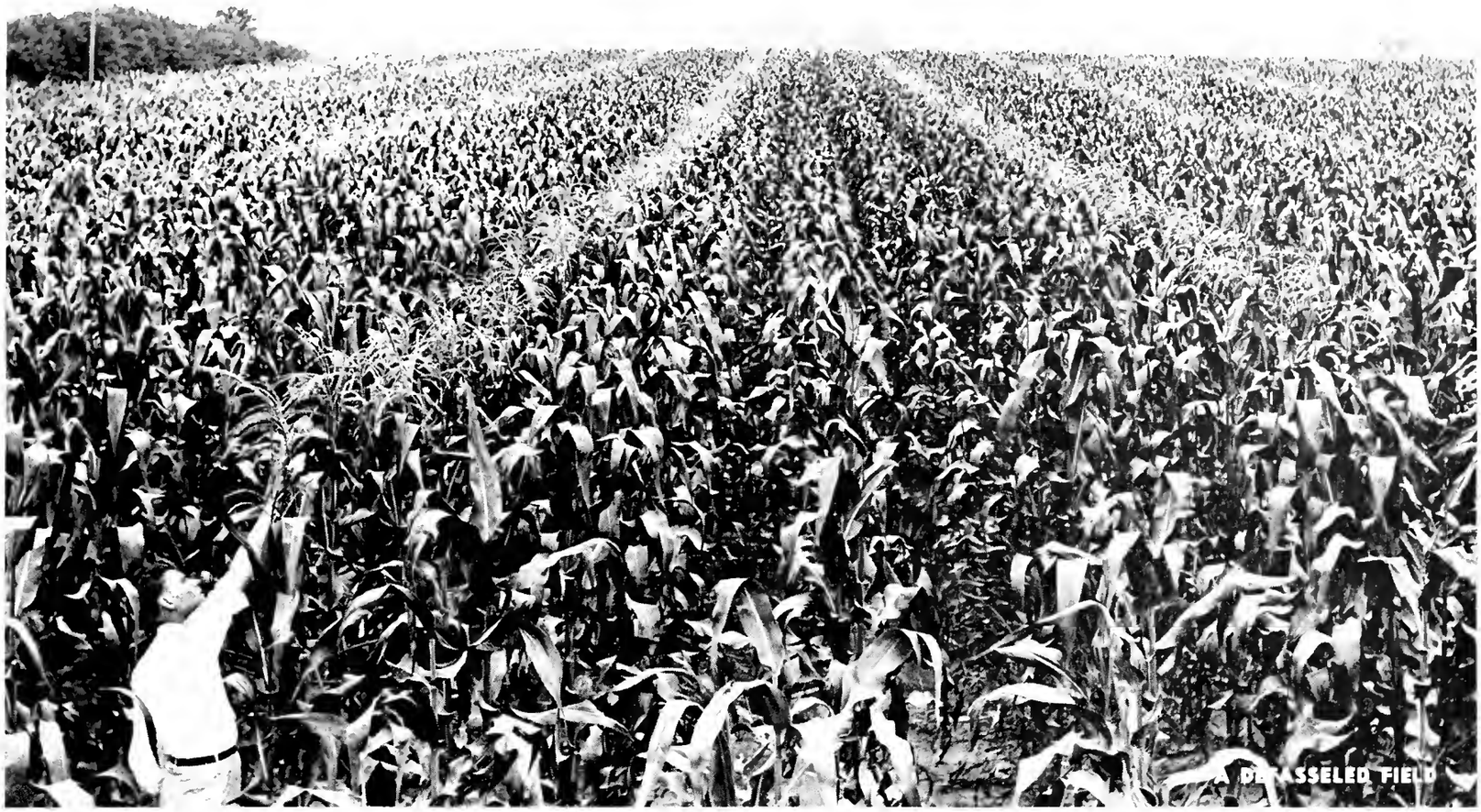


Top—A FIELD SHOWING TWO STRAINS OF INBREDS, A AND B, BEING CROSSED

Bottom—A CROSSING FIELD OF TWO OTHER STRAINS OF INBREDS, C AND D



THE FINAL "FOUR-WAY" HYBRID CROSS—THE FOURTH STEP



A DETASSELED FIELD

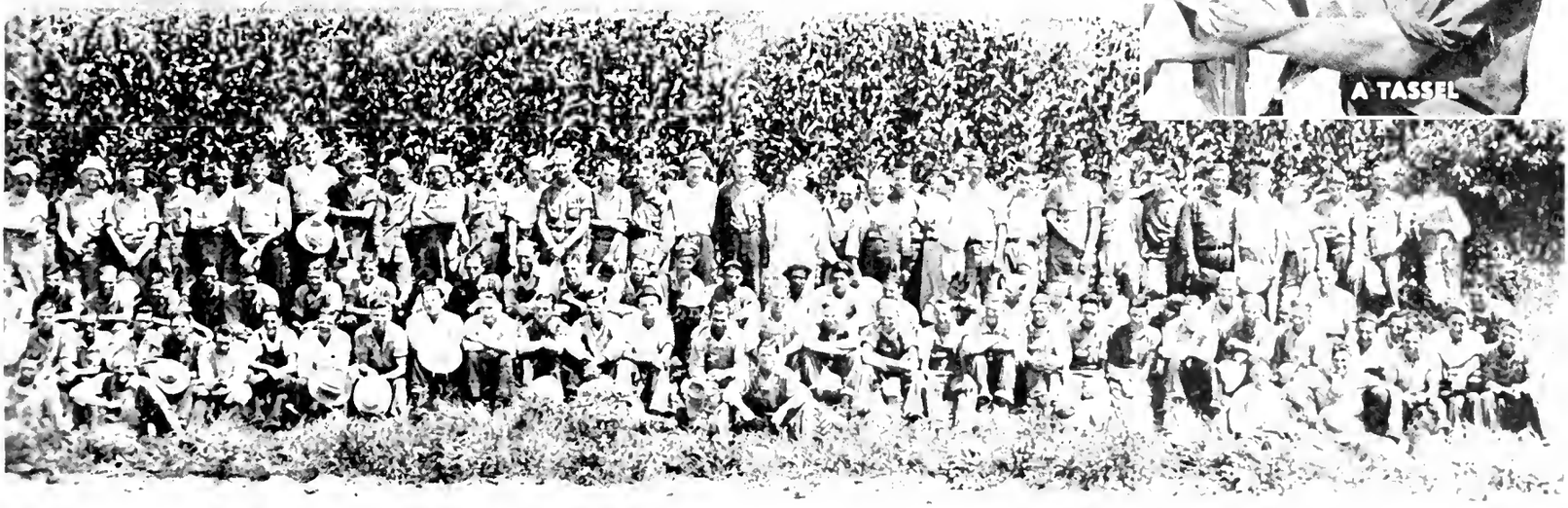
WHEN the SEED SUPPLY used in planting the two "single crosses" becomes large enough, the final "four-way" hybrid seed is produced in large PIONEER crossing fields from which the commercial corn is picked.

These fields require hundreds of capable men each summer for detasseling work. The fields are detasseled from twelve to fifteen times.

PIONEER corn breeders alternate four rows of one "single cross" (AxB) with one row of another "single cross" (CxD) all through a field. Each group of four rows (female) is detasseled, and the pollen from tassels of the one row (male) cross-pollinates the silks of the detasseled rows. The result is a "four-way" hybrid cross.

PIONEER Hybrid Seed Corn is picked only from the detasseled rows. The corn harvested from the male rows pollinated itself and cannot be used as hybrid seed corn.

A TASSEL



HUNDREDS AND HUNDREDS OF CAPABLE DETASSELERS WORK IN PIONEER SEED FIELDS EVERY SUMMER

RESULTS

SUPERIOR CORN BREEDING gives PIONEER hybrid seed corn these characteristics—high yield, stiff, sturdy stalks, heavy root system, strong shanks, large, sound ears, drought and disease resistance, uniformity, strong germination, and proper maturity.

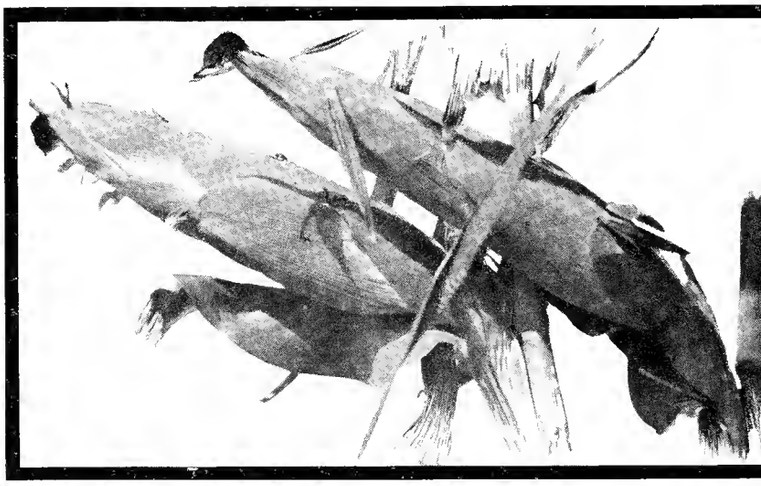
PIONEER has won the Banner Trophy for the highest yielding corn in the "Iowa Corn Yield Test" nine years out of the last fourteen.

PIONEER is the choice of thousands of farmers throughout the Corn Belt.

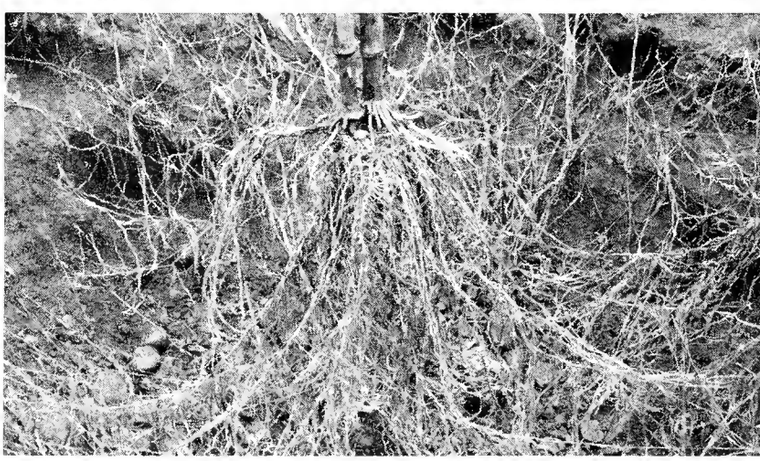
PIONEER *(Left)* and OPEN POLLINATED *(Right)* CORN after a WIND STORM

COMMERCIAL HYBRID CORN GROWN FROM PIONEER HYBRID SEED

PIONEER HYBRID STALKS *(Left)* GROW ONE OR TWO EAR
WHILE MANY OPEN-POLLINATED STALKS *(Right)* REMAIN BARRE



PIONEER HYBRID EARS . . . LARGE, SOLID, AND UNIFORM



A TYPICAL ROOT SYSTEM OF PIONEER HYBRID CORN